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BEFORE THE PUBLIC SERVICE COMMISSION. OF THE STATE OF DELAWARE OF THE STATE OF DELAWARE

IN THE MATTER OF THE APPLICATION OF

DELMARVA POWER AND LIGHT COMPANY

FOR APPROVAL OF SOLAR RENEWABLE

ENERGY CREDIT CONTRACTS AS SREC

SUPPLY SOURCES FOR STANDARD OFFER

SERVICE CUSTOMERS (Filed June 1, 2010)

)

TESTIMONY OF EXPERT WITNESS

JOHN BYRNE, PH.D.

DIRECTOR, CEEP
DISTIGUISHED PROFESSOR OF ENERGY AND CLIMATE POLICY

AUGUST 11, 2010

BYRNE - DIRECT

1	Q.	Please state your name and your occupation.
2	A.	My name is John Byrne and I am the Distinguished Professor of Energy and Climate
3		Policy at the University of Delaware, Newark, Delaware. I am the Director of the
4		University of Delaware's Center for Energy and Environmental Policy ("CEEP"), and I
5		am an expert in the field of renewable energy. A copy of my resume is attached hereto
6		as Exhibit 1.
7	Q.	Have you ever served as an expert witness and consultant for the Staff of the Delaware
8	·	Public Service Commission?
9	A.	Yes, I have on a number of occasions served as an expert consultant for the
10		Commission Staff and I have submitted testimony in that capacity to the Commission.
11	Q.	Are you familiar with the Delaware Sustainable Energy Utility?
12	A.	Yes, I am a co-chair of the Oversight Board of the Delaware SEU. I also served as a
13		member of the SEU Task Force, which is the predecessor to the current Oversight
14		Board. The SEU was established by the Delaware General Assembly through the
15		enactment of 29 Delaware Code § 8059. I was one of the principal proponents of the
16		establishment of the SEU.
17	Q.	Are you familiar with the Dover SUN Park project and the SEU's contracts to purchase
18		and sell SRECs related to that project?
19	A.	As the Co-Chair of the SEU and a member of its Executive Committee, I was involved
20		in the negotiation of the contracts between White Oak Solar Energy, LLC and the SEU,
21		and Delmarva Power and the SEU related to the purchase and sale of SREC's for the
22		Dover SUN Park project.

BYRNE - DIRECT

1	Q.	What has been your role in this proceeding as it pertains to the SEU?
2	A.	I reviewed the report of the Staff's consultants, New Energy Opportunities, Inc. and La
3		Capra Associates, Inc. I worked closely with the SEU's counsel, Francis Murphy, in
4		preparing a written response on behalf of the SEU and I have reviewed the response that
5		was filed with the Commission.
6	Q.	Did you prepare the spreadsheet that is attached as Exhibit A to the SEU's response?
7	A.	Yes, I prepared that spreadsheet to analyze the economic consequences that, in my
8		opinion, would ensue if the Commission were to adopt the conclusion of the Staff's
9	·	consultants and either disapprove the Delmarva/SEU contract, or scale it back by 90%.
10	Q.	You testified that you are familiar with the SEU's written response to the report of the
11		Staff's consultants. Would you please elaborate?
12	A.	Yes. The SEU's counsel has informed me that this docket is being handled on an
13		expedited basis and that it is vital that my testimony be submitted as soon as possible.
14	·	Therefore, time does not allow for the preparation and submission of extensive
15		testimony on my part. In light of the expedited nature of this proceeding, I simply wish
16		to reiterate that I assisted the SEU's counsel in preparing the SEU's written response. A
17		copy of the response and the related spreadsheet are attached hereto as Exhibit 2. The
18	·	factual assertions and opinions expressed in the response on page 4, Section C, on pages
19		5 and 6, Section D, and on pages 6 through 10 in the Argument came from me and I
20		support them as an expert and in my position as Co-Chair of the SEU. I could have
21		repeated those facts and opinions here, but time does not permit me to do so. Obviously

BYRNE-DIRECT

- the legal arguments and the discussion about legislative intent in the SEU's response are
- the product of the SEU's legal counsel.

EXHIBIT 1



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POSITIONS HELD

Director, Center for Energy and Environmental Policy, University of Delaware, 1984-present.

Co-executive Director, Joint Institute for a Sustainable Energy and Environmental Future, 1998-present.

Distinguished Professor of Energy and Climate Policy, University of Delaware, 2009-present.

Distinguished Professor of Public Policy, University of Delaware, 2004-2009.

Professor, Graduate School of Urban Affairs and Public Policy, University of Delaware, 1992-2004.

Director, M.A. and Ph.D. Program, Graduate School of Urban Affairs and Public Policy, University of Delaware, 1993-1996.

Associate Professor, Graduate School of Urban Affairs and Public Policy, University of Delaware, 1986-1992.

Assistant Professor, Graduate School of Urban Affairs and Public Policy, University of Delaware, 1982-1986.

Director, Energy Policy Research Group, University of Delaware, 1981-1984.

Visiting Assistant Professor, Center for the Study of Values, University of Delaware, 1981-1982.

HONORS AND SPECIAL APPOINTMENTS

Nobel Peace Prize, shared with researchers of the Intergovernmental Panel on Climate Change, 2007. (Based on service as a contributing author to Working Group III since 1992.)

United Nations Observer status, granted to CEEP for matters related to the Framework Convention on Climate Change and the UN Commission on Sustainable Development, 2000-present.

American Institute of Architects (AIA) Delaware Sustainability Award, 2009.

Member, Executive Board, International Solar Cities Initiative, 2000-present.

Policy Advisor, Environmental Forum, Korea National Assembly, 1998-present.

Environmental Expert, China National Foreign Expert Agency Register, 1997-present.

Contributing Author, Working Group III, Intergovernmental Panel on Climate Change, 1993-present.

Co-editor in chief, *Energy and Environment*. A WIRE reference work series published by Wiley & Sons, 2009-present.



Member, Council of Energy Research and Education Leaders and Council of Environmental Deans and Directors of the National Council for Science and Environment, 2009-present.

Co-editor, Bulletin of Science, Technology and Society, 2004-present. (Member, Editorial Board, Bulletin of Science, Technology and Society, 1994-2003.)

Member of the Board, International Association of Science, Technology and Society, 2005-present.

General Editor, *Energy and Environmental Policy*, book series published by Transaction Publishers, 1982-present.

Co-chair, Oversight Board, Delaware Sustainable Energy, 2008-present.

Co-founder and Principal, Urban Health and Environment Learning Project (UHELP – a collaborative organization created to address environmental justice concerns in Wilmington, Delaware – see http://www.urbanhelp.org), 2003-present.

Member, Board of Directors, Urban Environmental Center, 1997-present.

Member, Board of Directors, Environmental Market Solutions, Inc. 2001-2008.

Evaluator, Social Science and Humanities Research Council, Canada, 2001.

Member, Advisory Board, U.S. Council for Science and the Environment, 1999-2001.

Special Advisor, Sustainable and Peaceful Energy Network of Asia, 1998-2004.

Author, Graduate Program Policy Statement for a Master of Environmental and Energy Policy and a Ph.D. in Environmental and Energy Policy. Appointed by the Provost of the University of Delaware to chair a university-wide committee to create a new multi-college graduate program in environmental and energy policy. Proposal approved October 1997.

Special Advisor, The Energy Research Institute (TERI – formerly the Tata Energy Research Institute), 1994-1997.

Member, Advisory Board, Asia Energy Institute, 1994-1997.

Fulbright Senior Lecturer/Researcher Award, jointly affiliated with Seoul National University and the Korea Energy Economics Institute, 1995.

Evaluator, U.S. Environmental Protection Agency, Science to Achieve Results Program, 1999.

Evaluator, National Science Foundation/Lucent Technologies Industrial Ecology Fellowship Program, 1997.

Member, Energy and Environmental Systems Committee, Oak Ridge Associated Universities Council, 1990-1994.

Member, Editorial Board, Energy Sources, 1989-1993.

Excellence in Teaching Award, University of Delaware, 1988.

Postdoctoral Fellow, Center for the Study of Values, University of Delaware, 1980-1981.

DEGREES

Ph.D., Urban Affairs and Public Policy, University of Delaware, 1980.

M.A., Urban Affairs and Public Policy, University of Delaware, 1973.

B.A., Economics, University of Delaware, 1971.



RECENT PUBLICATIONS Books and Journals

- Sustainable Energy Utilities: New Energy Strategy for the New Climate. 2009. Co-editor with Kristen Hughes. Special issue of the Bulletin of Science, Technology and Society, Vol. 29, No. 2.
- Transforming Power: Energy, Environment and Society in Conflict. 2006. Co-editor with Noah Toly and Leigh Glover. Volume 9 in the Energy and Environmental Policy series. New Brunswick, NJ and London: Transaction Publishers.
- Water Conservation-Oriented Rates. 2005. With Young-Doo-Wang and William J. Smith Jr. Denver, CO: Water American Works Association.
- Energy Revolution: Toward an Energy-Efficient Future for South Korea. 2004. Co-author with Young-Doo Wang, Hoesung Lee, Jung Wk Kim and Jong-dall Kim. Seoul, South Korea: Maeil Kyung Jae.
- Environmental Justice: Discourses in International Political Economy. 2002. Co-editor with Cecilia Martinez and Leigh Glover. Volume 8 in the Energy and Environmental Policy series. New Brunswick, NJ and London: Transaction Publishers.
- Energy Controversy Part II: Reversing Course. 2002. Guest co-editor with Steven M. Hoffman. Special issue of the Bulletin of Science, Technology and Society, Vol. 22, No. 2. Sage Publications.
 - Energy Controversy Part I: Change and Resistance. 2001. Guest co-editor with Steven M. Hoffman. Special issue of the *Bulletin of Science, Technology and Society*, Vol. 21, No. 6 (December). Sage Publications.
- Governing the Atom: The Politics of Risk. 1996. With Steven M. Hoffman. Volume 7 in the Energy and Environmental Policy series. New Brunswick, NJ and London: Transaction Publishers.
- Energy and Environment: The Policy Challenge. 1992. Co-editor with Daniel Rich. Volume 6 in the Energy and Environmental Policy series. New Brunswick, NJ and London: Transaction Publishers.
- Toward Sustainable Energy, Environment and Development: Institutional Strategies for Indonesia, South Korea, Malaysia and Thailand. 1991. With Young-Doo Wang et al. Prepared for ESMAP/World Bank. A joint report of the Center for Energy and Environmental Policy, University of Delaware, the Korea Energy Economics Institute and the Environmental Planning Institute, Seoul National University.
- Energy, Environment and Sustainable World Development: Energy Options for the Year 2000. 1991. Special issue of Energy Sources, Vol. 13, No. 1. Co-editor with Steven M. Hoffman.
- Proceedings of the International Symposium on Energy Options for the Year 2000: Contemporary Concepts in Technology and Policy. 1988. Four volumes. Co-editor with Jorma Heinonen, Eino Kainlauri and Daniel Rich. Newark, DE: Center for Energy and Environmental Policy, University of Delaware.



- Planning for Changing Energy Conditions. 1988. Co-editor with Daniel Rich. Volume 4 in the Energy and Environmental Policy series. New Brunswick, NJ and London: Transaction Publishers.
- The Politics of Energy R&D. 1986. Co-editor with Daniel Rich. Volume 3 in the Energy and Environmental Policy series. New Brunswick, NJ and London: Transaction Publishers.
- Families and the Energy Transition. 1985. Co-editor with David A. Schulz and Marvin B. Sussman. Special issue of Marriage and Family Review 9/1-2 (Fall). Republished in book form by Haworth Press (1986).
- Energy and Cities. 1985. Co-editor with Daniel Rich. Volume 2 in the Energy and Environmental Policy series. New Brunswick, NJ and London: Transaction Publishers.
- Technology and Energy Choice. 1983. Co-editor with Mary Helen Callahan and Daniel Rich. Volume 1 in the <u>Energy and Environmental Policy</u> series. Newark, DE: Center for Energy and Environmental Policy.
- The Solar Energy Transition: Implementation and Policy Implications. 1983. Co-editor with Daniel Rich, Allen M. Barnett and Jon M. Veigel. Boulder, CO: Westview Press for the American Association for the Advancement of Science.

Articles and Chapters

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- "Relocating Energy in the Social Commons: Ideas for a Sustainable Energy Utility." 2009. With Cecilia Martinez and Colin Ruggero. *Bulletin of Science, Technology and Society.* Vol. 29, No. 2: 81-94.
- "Delaware's Sustainable Energy Utility." 2009. With Cecilia Martinez. *Delaware Lawyer* (summer): 26-31.
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- "Energy as a Social Project: Recovering a Discourse." 2006. With Noah Toly. In *Transforming Power: Energy, Environment and Society in Conflict.* J. Byrne et al eds. (see Books and Journals). Pp. 1-32.



- "Hydrogen Highways: Lessons on the Energy Technology-Policy Interface." 2006. With A. Waegel, D. Tobin and B. Haney. *Bulletin of Science, Technology and Society*. Vol. 26, No. 4: 288-298. Special issue "Hydrogen: Facts and Fictions."
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"Power Liberalization and Neo-Liberalism: South Korea's Electricity Reform at a Crossroads." 2004. With Leigh Glover, Hoesung Lee, Young-Doo Wang and Jung-Min Yu. *Pacific Affairs*. Vol. 77, No. 3: 493-516.

"The Role of Technology in Achieving Environmental Policy Goals in the Maritime Transport System." 2004. With Melissa Thies, Nicole Cass, et al. *Transportation Record: The Journal of the Transportation Research Board.* No. 1877: 42-49.

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- "Less Energy, a Better Economy, and a Sustainable South Korea: An Energy Efficiency Scenario Analysis." 2002. With Young-Doo Wang et al. *Bulletin of Science, Technology and Society*. Vol. 22, No. 2: 110-122.
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- "Designing Revenue Neutral and Equitable Water Conservation-Oriented Rates for Use During Drought Summer Months." 2002. With Young-Doo Wang et al. *Proceedings of the Water Sources Conference*. American Water Works Association (CD-Rom). January 27-30. Las Vegas, Nevada.
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- "Economics of Building Integrated PV In China." 2001. With Gerard Alleng and Aiming Zhou. *Proceedings of the Green Buildings Workshop*. Shanghai, China. Environmental Market Solutions, Inc. (Washington, D.C.) and Pacific Energy Research Center, Tongji University (Shanghai, China) (July).
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- "Climate Shopping: Putting the Atmosphere Up for Sale." 2000. With Leigh Glover. In *TELA: Environment, Economy and Society* series: 28 pp. Melbourne, Australia: Australian Conservation Foundation.
- "Ecological Justice in the Greenhouse." 2000. With Young-Doo Wang, Gerard Alleng, Leigh Glover, Vernese Innis and Yu Mi Mun. Position paper prepared for the Sixth Session of the Conference of Parties (COP-6), held in The Hague, Netherlands, to negotiate implementation of the UN Framework Convention on Climate Change. Newark, DE: Center for Energy and Environmental Policy, University of Delaware.



- "The Brownfields Challenge Environmental Justice and Community Participation: Lessons from National Brownfields Pilot Projects." 2000. With Raymond Scattone. *Proceedings of Brownfields 2000: Revisiting the American Community*, Atlantic City, NJ (October). Co-sponsored by the U.S. Conference of Mayors, U.S. Department of Housing and Urban Development, the U.S. Environmental Protection Agency, others.
- "Beyond Pollution and Risk: Energy and Environmental Policy in the Greenhouse." With Tze Luen Lin. 2000. *Proceedings of the International Conference on Sustainable Energy and Environmental Strategies*, Taipei, Taiwan (September): 1-23.
- "An International Comparison of the Economics of Building Integrated PV in Different Resource, Pricing and Policy Environments: The Cases of the U.S., Japan and South Korea." 2000. With Lawrence Agbemabiese et al. *Proceedings of the American Solar Energy Society Solar 2000 Conference*, Madison, WI (June): 81-85.
- "Efficient Global Warming: Contradictions in Liberal Democratic Responses to Global Environmental Problems." 1999. With Sun-Jin Yun. *Bulletin of Science, Technology and Society*. Vol. 19, No. 6 (December): 493-500.
- "Evaluating the Persistence of Residential Water Conservation: A 1992-97 Panel Study of a Water Utility Program in Delaware." 1999. With Young-Doo Wang et al. *Journal of the American Water Resources Association*. Vol. 35, No. 5 (October):1269-1276.
- "Mitigating CO₂ Emissions of the Republic of Korea: The Role of Energy Efficiency Measures." 1999. With Young-Doo Wang, Kyung Jin Boo, Jung Wk Kim and Jong-dall Kim. *Proceedings of the 20th Annual North American Conference of the U.S. Association for Energy Economics*. Orlando, FL (August): 319-328.
- "Climate Change and Renewable Energy: Opportunities and Challenges for Korea." 1999. John Byrne. In *Proceedings of the International Symposium on Climate Change and Alternative Energy Development*. Sponsored by the Environmental Forum of the Korea National Assembly. Seoul, Korea: 49-82.
- "Environmental Impacts of Building Integrated PV Applications in the State Public Buildings Sector." 1999. With Lawrence Agbemabiese, James Kliesch, Constantine Hadjilambrinos, Patrina Eiffert, and Ralph Nigro. *Proceedings of the American Solar Energy Society Solar 99 Conference*, Portland, Maine (June): 425-429.
- "The Role of Local Planning in Meeting National CO₂ Reduction Targets: An American Case Study." 1998. With Yda Schreuder and David Redlin. In *Proceedings of the International Resource Accounting Modeling Workshop.* Groningen, The Netherlands, September 16-17.
- "Strategies to Reclaim our Atmospheric Commons." 1998. With Young-Doo Wang et al. Position paper prepared for the Fourth Session of the Conference of Parties (COP-4), held in Buenos Aires, Argentina, to negotiate implementation of the UN Framework Convention on Climate Change. Newark, DE: Center for Energy and Environmental Policy, University of Delaware.
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- "An Equity- and Sustainability-Based Policy Response to Global Climate Change." 1998. With Young-Doo Wang, Hoesung Lee and Jong-dall Kim. *Energy Policy*. Vol. 26, No. 4 (March): 335-343.
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RECENT FUNDED RESEARCH AND PROFESSIONAL ACTIVITY

Principal investigator, "A Comprehensive Review of Solar Energy Policy, Market, and Technology Trends." World Bank, 2008-present.

Principal investigator, "Preparation of a Carbon Emissions Inventory and Climate Change Action Plan for the University of Delaware," University of Delaware 2008 Senior Class Gift, 2008-present.

Co-principal investigator, "Sustainable Energy from Solar Hydrogen," National Science Foundation – Integrative Graduate Education and Training (IGERT) grant, 2006-present.

Principal investigator, "Renewable Energy Analysis and Design Yearly," Conectiv Power Delivery, 2003-present.

Grant administrator, Endowment from the W. Alton Jones Foundation, 2001-present.

Principal investigator, "Science, Engineering and Technology Issues," Delaware General Assembly, 1994-present.

Principal investigator, "Energy and Environmental Policy Analysis Development Grant," UNIDEL Foundation, 1992-present.



Principal investigator, "Foundations for a U.S. Hydrogen Economy: Understanding the Role, Influences, and Relations between Policy, Planning, and Markets," BP Foundation, 2004-2008.

Principal investigator, "Review of Renewable Energy Policies and Resource Potential in East Asian Countries," Korea Energy Economics Institute, 2005.

Principal investigator, "Review of Climate Change Policy Responses of Australia, Japan, the UK and the U.S., Including the Role of Renewable Energy," Korea Energy Economics Institute, 2004-2005.

Principal investigator, "Knowledge Synthesis: Organic Agriculture in a Global Perspective," Danish Research Centre for Organic Farming, 2004-2005.

Principal investigator, "Assateague Barrier Island Education Center Renewable Energy Project," joint U.S. Department of Energy-National Park Service award of the University-National Park Energy Partnership Program to Rochester Institute of Technology and subcontracted to CEEP, 2004-2005.

Principal investigator, "Health, Economic, Energy and Ecological Impacts of Integrated Agricultural Bioenergy Systems for Small Farms in China," Blue Moon Fund, 2003-2005.

Principal investigator, "Review of U.S. Restructuring Experience and Its Lessons for Korea's Electricity Industry," Korea Electric Power Corporation, 2003-2005.

Principal investigator, "Policy Options to Support Distributed Resources," Conectiv Power Delivery, 2003-2005.

Principal investigator, "Review of Energy-based Clean Development Mechanism Projects in Australia, Japan, and the UK," Korea Energy Economics Institute, 2004.

Principal investigator, "Integrated Resource Planning for Nepal: A Capability Assessment," U.S. Agency for International Development award to Academy for Educational Development and subcontracted to CEEP, 2003-2004.

Principal investigator, "Delaware Industries of the Future Initiative," U.S. Department of Energy award to the Delaware Energy Office and subcontracted to CEEP, 2002-2004.

Principal investigator, "Local Natural Energy Resources and Rural Development: Focus on Latin America," UN Institute for Training and Research, 2003.

Principal investigator, "Renewable Energy Analysis," National Renewable Energy Laboratory and U.S. Department of Energy, 2001.

Principal investigator, "Sustainable Energy and Environmental Strategies for Taiwan," W. Alton Jones Foundation, 1999-2002

Principal investigator, "Establishment of a Joint Institute for a Sustainable Energy and Environmental Future in Korea," W. Alton Jones Foundation, 1998-2004.

Principal investigator, "Renewable Energy Options for Asia," National Renewable Energy Laboratory and U.S. Department of Energy, 1995-2002 (includes analyses for China and Korea).

Principal investigator, "Preparation of a State Action Plan for Reduction of Greenhouse Gas Emissions," U.S. Environmental Protection Agency, 1997-2000.

Principal investigator, "Economic Analysis of Intermediate Applications of PV in the Buildings Sectors of Industrial Countries," National Renewable Energy Laboratory and U.S. Department of Energy, 1995-2000 (includes analyses for the U.S. and Japan).

Principal investigator, "Restructuring the Korea Electricity Power Corporation: Economic and Environmental Lessons from U.S. Power Pool Experience," Subcontractor to Korea Energy Economics Institute on KEPCO-funded project, 1998-1999.



Principal investigator, "Environmental Benefits of a Targeted Program of Photovoltaic Applications on U.S. Public Buildings: A State-by-State Analysis," National Renewable Energy Laboratory, 1998-99.

Principal investigator, "National Policies and Their Impacts in Reducing CO₂ Emissions of the Republic of Korea," Subcontractor to Hagler-Bailly on USAID-funded project, 1998.

Technical expert, "Sustainable Energy and Environmental Planning," China National Environmental Protection Agency, 1997.

Principal investigator, "Evaluation of Photovoltaic Technology for Utility Applications," National Renewable Energy Laboratory and U.S. Department of Energy, 1991-97.

Co-principal investigator, "Program in Energy, Environment, Resources and Sustainability," a certificate program jointly offered with the Tata Energy Research Institute for mid-career private, public and NGO officials from India, Nepal and Sri Lanka. Supported by USAID, the U.S. Department of Energy and the UN University, 1995 and 1996.

Principal investigator, "CO₂ Mitigation Strategies for the Korean Buildings Sector," Ministry of Trade, Industry and Energy, Republic of Korea, 1995-96.

Co-principal investigator, "Energy-Efficient Spatial Development Strategies for Korea," subcontract with the Korea Energy Economics Institute, 1995-96.

Member, Environmental Regulation Task Force, Office of the Governor, State of Delaware and Delaware Public Policy Institute, 1995-96.

Principal investigator, "Preparation of a State-Level Greenhouse Gas Inventory," U.S. Environmental Protection Agency, 1994-95.

Member, Public Utility Regulation Task Force, Office of the Governor, State of Delaware, 1994-95.

Technical expert, "Renewable Energy Options for China." United Nations Development Program and Chinese Academy of Science, 1994.

Technical expert, "Integrated Resource Planning for the People's Republic of China," United Nations Development Program and Chinese Academy of Science, 1993.

Co-principal investigator, "Energy Efficiency and Environmental Protection Institutions in East and Southeast Asia," ESMAP/World Bank, 1990-1991 (joint project with Korea Energy Economics Institute, Republic of Korea and Environmental Planning Institute, Seoul National University).

Co-principal investigator, "Demand-Side Bidding: Potential and Options" (a national survey of U.S. utility industry and state regulatory authorities), Electric Power Partners Program, 1990-1991.

Co-investigator, "Regulatory Policy for Photovoltaics: Utility Impacts and Implications" (a national survey of U.S. utility industry and state regulatory authorities), Electric Power Partners Program, 1989-1990.

Investigator, "A Review of the U.S. Experience in Evaluating Urban Regeneration Initiatives," 1988-1990 (joint project with the University of Reading, United Kingdom).

Principal investigator, "Evaluation of State Weatherization Assistance Programs," Division of Community Services, State of Delaware, 1988.

Co-principal investigator, "Evaluation of Integrated Resource Plans for Delaware," Delaware Public Service Commission, 1986-1990.

Principal investigator, "Energy Policy Analysis Development Grant," UNIDEL Foundation, 1982-1990.



Member, Planning and Program Committees, 1991 International Symposium on Energy and Environment. Co-sponsors: UNESCO, Finnish Ministry of Trade and Industry, VGB Technical Association of Large Power Plant Operators (FRG), Institut Francais du Petrole, and University of Delaware.

Member, Planning Committee, 1989 Global Alliance Forum for Mutual Survival. Cosponsors: Global Tomorrow Coalition and the University of Delaware.

Chair, Planning Committee, 1988 International Symposium on Energy Options for the Year 2000: Contemporary Concepts in Technology and Policy. Co-sponsors: U.S. Department of Energy, Finnish Ministry of Trade and Industry, Iowa State University, University of Delaware, American Council for an Energy-Efficient Economy, American Society of Heating, Refrigerating and Air-Conditioning Engineers.

Expert staff to Joint Agency Review Committee of the Delaware State Legislature, regarding "sunset" review of the Delaware Public Service Commission, 1984-1985.

Arranger, Environmental Policy Colloquium Series, University of Delaware, 1990-present.

Arranger, International Development Colloquium Series, University of Delaware, 1989-present.

Arranger, Energy Policy Colloquium Series, University of Delaware, 1980-present. Arranger, Science and Society Lecture Series, University of Delaware, 1995-96.

EXHIBIT 2

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF DELAWARE

IN THE MATTER OF THE APPLICATION OF)	
DELMARVA POWER AND LIGHT COMPANY)	
FOR APPROVAL OF SOLAR RENEWABLE)	
ENERGY CREDIT CONTRACTS AS SREC)	PSC DOCKET NO. 10-198
SUPPLY SOURCES FOR STANDARD OFFER)	
SERVICE CUSTOMERS (Filed June 1, 2010))	·

DELAWARE SUSTAINABLE ENERGY UTILITY, INC.'S
RESPONSE TO STAFF'S REPORT ON DELMARVA POWER'S REQUEST FOR
APPROVAL OF SOLAR RENEWABLE ENERGY CREDIT CONTRACTS

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Dated: August 10, 2010

I. Statement of Facts

A. The Delaware Sustainable Energy Utility ("SEU")

The SEU is a nonprofit Delaware corporation established by 29 *Delaware Code* § 8059. The SEU was created by the General Assembly to promote the public interest, as reflected in the enabling legislation § 8059(b):

(b) Intent of legislation. -- The General Assembly finds that there remain in Delaware significant, cost-effective opportunities to acquire end-user energy efficiency savings that can lower customers' bills and reduce the environmental impacts of energy production, delivery, and use. Delaware has an opportunity to create new markets for customer-sited renewable energy generation that will help build jobs in Delaware, improve our national security, keep value within the local economy, improve energy reliability, and protect Delawareans from the damaging effects of recurrent energy price spikes.

Under $\S 8059(g)(1)(d)$, the SEU, through its contract administrator, has the following responsibilities (among many others):

- 3. To promote program initiatives and market strategies that address the needs of persons or businesses facing the most significant barriers to participation;
- 4. To promote coordinated program delivery, including coordination with low income weatherization programs, other efficiency programs, and utility programs;
- 5. To coordinate with relevant regional and national energy efforts and markets, including markets for pollution emissions offsets and credits, and renewable energy credits;
- 6. To consider innovative approaches to delivering sustainable energy services, including strategies to encourage third party financing and leveraged customer contributions to the cost of program measures, as consistent with principles of sound program design;
- 7. To offer "one-stop shopping" and be the point-of-contact for sustainable energy services in Delaware.

The General Assembly intends that the SEU plays a key role in stabilizing the SREC market in Delaware. See, e.g., 26 Delaware Code § 360(c); 29 Delaware Code § 8059(g). Delmarva's contract with the SEU, therefore, is a contract with a not-for-profit, state-created entity, and from the SEU's perspective, the contract promotes stability in the SREC market. In addition, as will be explained more fully below, the SEU contends that the contract will create financial benefits for Delmarva's customers in the long run, will benefit the State's solar industry and the development of additional solar projects in Delaware, and will serve the public interest in other substantial ways.

B. The Delaware General Assembly's Intent to Promote Renewable Energy

The Delaware Code, including the provisions referred to above, 1) demonstrate the General Assembly's intent to promote the development of renewable energy in Delaware, and 2) establish that the General Assembly considers the development of renewable solar projects as vital to the public interest.

For example, Title 26 of the *Delaware Code* § 351 of the Renewable Portfolio Energy Standards Act ("RPS") provides, in part:

- (b) The General Assembly finds and declares that the benefits of electricity from renewable energy resources accrue to the public at large, and that electric suppliers and consumers share an obligation to develop a minimum level of these resources in the electricity supply portfolio of the state. These benefits include improved regional and local air quality, improved public health, increased electric supply diversity, increased protection against price volatility and supply disruption, improved transmission and distribution performance, and new economic development opportunities.
- (c) It is therefore the purpose and intent of the General Assembly in enacting the Renewable Energy Portfolio Standards Act to establish a market for electricity from these resources in Delaware, and to lower the cost to consumers of electricity from these resources.

Similarly, Section 1500(b) of The Energy Efficiency Resource Standards Act of 2009 reflects Delaware public policy as adopted by the General Assembly:

- (b) The General Assembly finds and declares that:
- (1) Cost effective energy efficiency shall be considered as an energy supply source before any increase or expansion of traditional energy supplies; and

- (2) Energy efficiency is among the least expensive ways to meet the growing energy demands of the State; and
- (3) Providing affordable, reliable, and clean energy for all consumers in Delaware is in the public interest and will yield social, economic, and welfare benefits for generations to come; and
- (4) The benefits of a strong focus on cost effective energy efficiency accrue to the public at large, and all electric and natural gas suppliers and consumers in Delaware share an obligation to develop a minimum level of these resources in the energy supply portfolio of the State.
- (5) The benefits of cost effective energy efficiency include lowered consumer spending on energy, improved regional and local air quality, improved public health, increased electric supply diversity, increased protection against price volatility and supply disruption, improved transmission and distribution performance, and new economic development opportunities; and
- (6) The Delaware Sustainable Energy Utility (SEU) combines public funding sources and consumer savings with private sector funds and management skills to provide all Delaware energy users with assistance for all their energy efficiency and renewable energy needs; and
- (7) The SEU is a critical mechanism for achieving energy conservation and energy efficiency in the State.

C. The Dover Sun Park and Related Contracts

The Dover Sun Park is a major renewable energy initiative launched by the City of Dover whose purpose is to construct one of the largest solar energy facilities on the east coast of the United States. The project's importance to Delaware and its citizens in terms of increased electric supply diversity, local air quality, protection against price volatility and supply disruption, the local economy, and the state's solar industry are self-evident. The contracts related to the new facility between Delmarva and White Oak, White Oak and the SEU, and Delmarva and the SEU related to the purchase and sale of SRECs took months to negotiate. The Delmarva/SEU contract reflects the best judgment of the parties in terms of the current and future SREC market and the needs of Delmarva to purchase SRECs under the Delaware Renewable Energy Portfolio Standards Act in 26 Delaware Code § 351 et seq.

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D. The Delmarva/SEU Contract and the Public Interest

The Delmarva/SEU contract for the purchase and sale of SRECs promotes the public interest. If Delmarva can satisfy all or a greater portion of its RPS requirements from the Dover Sun Park project, it will not be required to invest in other solar projects in Delaware. If the contract is rejected by the Commission, the SEU has calculated that the solar industry will lose approximately \$6,142,777 that Delmarva would otherwise be required to invest in SREC purchases for projects during the period from 2011 through 2014. See Exhibit A hereto. This would be a serious blow to the developing solar industry in Delaware.

Rejection of the Delmarva/SEU contract would also have the effect of driving SREC prices up substantially, which would have a negative effect on Delmarva and its customers in the long run. Assume, for example, that the current solar installation market in Delaware is dominated by projects smaller than 300 kW in size and require an SREC price closer to \$275 in order for these projects to supply electricity to customers (mainly medium to small Commercial & Industrial and residential) at prices competitive with existing retail electricity rates. Further assume that this market will transition to include larger projects over time but this will take years and requires market growth to attract investment. Thus, a key factor affecting future SREC prices is a healthy local solar industry.

If the SEU does not participate in the Dover Sun Park project, the demand for projects at or below 300 kW during the critical period of market development over the next five years will be slowed. Without SEU participation, DPL will satisfy its legal obligation entirely in 2011 from the Dover Sun Park and a significant part of its obligation in 2012 from this single project. In 2013 and 2014, the demand for SRECs expands because of the new RPS. But if the SEU does not participate, an important share of SREC sales that could go to projects of 300 kW or less will be lost (over 10,000 MWh, representing more than \$2.7 million in revenue). These effects would seriously hamper solar industry growth at precisely the time when utility requirements to purchase SRECs are increasing rapidly. With utility demand for SRECs growing and industry capacity hurt by a lack of revenue for the projects that make up the bulk of the market, SREC prices will climb higher than they otherwise would have. Supply slows while demand grows -- prices will increase -- ECON 101.

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While Delmarva would potentially save \$0.71 million in the short run by not buying SRECs from the SEU, its ratepayers are put at greater risk of higher future SREC prices. Moreover, because the Delaware solar industry will not grow as it would have, ratepayer funds will be used in future years to fund out-of-state projects in order for DPL to comply with the Delaware RPS policy.

II. ARGUMENT

A. The Delmarva/SEU Contract Serves the Public Interest and Should Be Approved.

Under 26 Delaware Code § 1007(b), the issue before the Commission is whether the Delmarva/SEU contract "is in the public interest." Based upon its submissions in this proceeding, Delmarva Power obviously considers the Delmarva/SEU contract to be in the best interests of the company and its ratepayers. In addition, based upon its submissions, Delmarva considers the contract to favor the interests of the general public and the State of Delaware as a whole. The SEU agrees.

In making its determination about the "public interest," the Commission must consider the benefits to Delaware as a whole. Constellation New Energy, Inc. v. Public Service Commission, 825 A.2d 872, 883 (Del. Super. 2003) (noting that settlement was supported by evidence of "other benefits to Delaware"). The Delmarva/SEU contract will benefit Delaware as a whole.

First, the Delaware RPS law requires Delmarva to purchase SREC's in order to promote solar renewable energy projects. At this juncture, the Commission may assume that the Dover Sun Park project is going to be built. Therefore, Delmarva does not have to purchase any additional SRECs from the project to promote its construction.

The Staff's consultants note that the General Assembly amended the RPS law in Senate Substitute No. 1 for Senate Bill 119 ("SSSB 119"), which passed the Legislature on June 29, 2010. SSSB 119 increased the SREC purchase requirements imposed on Delmarva (and other utilities). The consultants conclude that Delmarva should purchase the additional SRECs from White Oak for the Dover Sun Park, and forego its contract with the SEU. However, that approach will have Delmarva dedicate SREC purchases to a solar project which is underway, meaning that Delmarva will not have to purchase SRECs which would support new solar projects in Delaware. According to the SEU's calculations, the consultants' approach would

remove about \$6,142,777 from the SREC market that Delmarva would otherwise direct to new solar photovoltaic projects. And the SEU estimates that SRECs account for approximately 25% to 40% of the revenue requirement for solar projects to attract investors and sell energy at or below current retail electricity rates. The shortfall and the disappearance of Delmarva from the market for a year or more will have serious negative consequences for the solar industry and the SREC market in Delaware. It will also mean that Delaware will not realize the benefits of the additional solar projects, among them, lower consumer spending on energy, new jobs and new economic development opportunities, improved local air quality, improved public health, increased electric supply diversity, and increased protection against price volatility and supply disruption. See, e.g., 26 Delaware Code § 1500(b). As the Delaware General Assembly has declared: "Providing affordable, reliable, and clean energy for all consumers in Delaware is in the public interest." 26 Delaware Code § 1500(b)(3).

The impact would be hardest on Delaware companies providing small- to medium-scale solar applications to households and businesses (i.e., installations which are less than 100 kW in size, whose SRECs currently sell for \$275 or more). Solar technology is one of the few ways that residents and small businesses can protect themselves against volatile energy prices, especially natural gas prices. With the SREC market crippled for a year or more, these consumers lose a critical tool for affordable energy management in times of high energy cost risk.

The Governor and the General Assembly have identified clean energy as a key growth sector for the State. The drying up of the SREC market for projects other than the Dover Sun Park would seriously hamper State efforts to promote clean energy. Based on national estimates of the job creation impacts of solar PV investment, the loss of more than \$6 million in revenues to the local market will likely result in 70-100 fewer permanent jobs in Delaware. These impacts must be weighed against the ratepayer savings from the Dover Sun Park without SEU participation of \$0.71 million. Even these savings may not materialize. By 2015, Delmarva Power will need to purchase 45,020 SRECs to meet its statutory obligation. By 2019, this

¹ American Solar Energy Society (2007). Renewable Energy and Energy Efficiency: Economic Drivers for the 21st Century.

² The difference between the SEU price of \$249 to Delmarva when it purchases 11,000 SRECs in 2015 and 11,000 in 2016, and the White Oak price of \$216.70: \$249 minus \$216.70 = \$32.30 x 22,000 SRECs = \$710,600.

volume increases to 93,640. With the solar industry having suffered a crippling blow without SEU participation in the Dover Sun Park project, it is likely to be very difficult for this demand to be met by in-state projects. Job loss and a foregone opportunity to be a clean energy leader will surely result. In that context, near-term ratepayer savings of \$0.71 million may earn these same ratepayers several years of high SREC prices, as utility demand chases a dwindling capacity to build projects in Delaware and ratepayers are forced to fund projects in other states to support Delmarva Power's satisfaction of its statutory obligation. Ratepayer funded migration of utility solar investment out of state, possibly in the tens of millions of dollars from 2015 to 2019 and beyond, is hardly a winning proposition for ratepayers or the State's industry, its economy and its environment.

At a cost of \$0.71 million in the short term, it is likely that ratepayers and the State will experience several-fold economic gains as a result of a healthy, growing solar industry. The SEU's participation in the Dover Sun Park transaction is good for job creation, local economic development, consumer protection against volatile energy prices, and protection of the local environment. The Commission is asked to approve the proposed purchase of SRECs by Delmarva Power in 2015 ad 2016 from the SEU in order to secure these benefits to ratepayers and to the State. It is clearly in the public interest to move forward with the agreement supported by Delmarva Power, the City of Dover, the Delaware Municipal Electric Corporation and the Governor of Delaware, all of whom signed a June 15, 2010 proclamation favoring the transaction which includes the SEU's participation.

B. The Consultants Seek to Substitute Their Business Judgment for Delmarva's and They Disregard the Authority that the General Assembly has Vested in the SEU.

The analysis of the Delmarva/SEU contract involves weighing the public interest, assessing the stability and risks associated with the SREC market in Delaware, projecting the price for SRECs in 2015 and 2016, and other relevant factors. Delmarva has exercised its business judgment and has determined that obtaining Commission approval of the Delmarva/SEU contract is in the interests of the company, its ratepayers, and Delaware. The Consultants have not established by any stretch that the contract is contrary to the public interest. Indeed their report lacks a true analysis of the public interest. Instead the Consultants ask the Commission to substitute their judgment about the many variables involved for that of Delmarva.

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However, Delmarva's business judgment should be afforded deference by the Commission. Compare Application of Diamond State Telephone Co., 103 A.2d. 304, 319 (Del. Super. 1954), aff'd in part and rev'd in part, 107 A.2d 786 (Del. 1954), modified on reargument, 113 A.2d 437 (Del. 1955)(Commission is not the financial manager of corporation and should not substitute is judgment for directors).

In addition, the Consultants fail to address the SEU's statutory role in preserving the stability of the SREC market in Delaware and promoting renewable energy projects. The SEU was created by Delaware law and is only seeking to perform the very functions that the General Assembly created for it. The Consultants seek to substitute their judgment for the judgment of the SEU as to what is in the public interest. The SEU is a nonprofit organization with a volunteer Oversight Board, and therefore cannot realize any economic gain from its contract with Delmarva, which was undeniably negotiated in an arms length transaction. The Commission should certainly afford some measure of deference to the SEU in the performance of its statutory duties.

C. The Consultants' Report Misapplies and Misinterprets the Intent of the 2010 Amendment to the RPS Law.

and other utilities, was passed by the General Assembly on June 29, 2010, and signed by the Governor on July 28, 2010. As the Consultants observe, the Delmarva/SEU contract was signed on April 22, 2010, more than two months earlier. The General Assembly was well aware of the Delmarva/SEU contract when it enacted SSSB 119. Indeed, the Dover Sun Park project and the Delmarva/SEU contract provided significant motivators for the introduction and passage of SSSB 119, because the Dover project signaled that there would be sufficient solar power coming on line in future years, so that an increase in the RPS requirements was feasible. In light of the Dover Sun Park Project, the Delmarva/SEU contract, and Delmarva's increased need for SRECs under the 2010 amendment, the legislation was intended to create the impetus for new solar projects, in addition to the Dover Sun Park. Ironically, the Consultants seek to frustrate the very purpose of the RPS amendment by forcing Delmarva, against its own business judgment, to purchase additional SRECs from the Dover Sun Park project, rather than dedicate its resources to

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new solar projects in Delaware. The Consultants' conclusions are contrary to the intent and meaning of Delaware statutes governing the SEU, renewable energy initiatives, and the RPS statute, and contrary to the public interest.

III. CONCLUSION

Based upon the foregoing facts, arguments, and authorities, the SEU respectfully submits that the Commission should approve the Delmarva/SEU contract and reject the conclusions of the Staff's consultants.

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EXHIBIT A

Estimated SREC Revenue Loss in DE if SEU does not participate in Dover SUN Park

			· T			
	Delmarva Power Estimated MWh Sales - SOS		DDG Oxlan	Solar REC Requirements	Solar REC Requirements (MWh) 2010	Dover SUN Park SREC Generation
	Residential and	RPS Solar	RPS Solar	(MWh) 2007 RPS Bill	RPS Bill	through 2025
Year	Small C/I	% 2007 Bill	% 2010 Bill	KP3 Bill	I O Dill	unough Louis
Annual	Page 2, App. A.,					
Sales	DPL IRP December	:	·	:		
Growth	1, 2008	0.0000/	0.00000		i	
2007		0.000%		440.91	440.91	
2008		0.011%			564.59	
2009		0.014%			775.44	
2010		0.018%			8,692.00	14,066.00
2011	4,346,000	0.048%			17,568.00	13,995.67
2012		0.099%			26,574.00	13,925.69
2013		0.201%			35,704.00	
2014	4,463,000	0.354%				
2015		0.559%			45,020.00	
2016	4,548,000	0.803%			56,850.00	
2017	4,588,000	1.112%			68,820.00	
2018	4,633,000				81,077.50	
2019	4,682,000	2.005%				
2020			2.250%		106,447.50	
2021	4,804,331		2.500%		120,108.26	
2022			2.750%		134,166.93	
2023	4,954,419		3.000%	<u></u>	148,632.57	
2024			3.250%		163,514.41	
2025			3.500%	, 0	178,821.87	13,112.75

Total SREC Market
Reduction when SEU does
NOT participate

Total Dollar Value Lost (Nominal; SREC = \$275)

SEU SREC buys from Dover SUN Park	DPL SREC buys from Dover SUN Park assumes SEU buys	Remaining DPL SREC Market assumes SEU participates	DPL SREC buys from Dover SUN Park assumes No SEU	Remaining DPL SREC Demand NO SEU (DPL uses 3-yr bank credit)	DE SREC Market Reduction when SEU does not participate
5,626.40 5,598.27	4,219.80 4,198.70	4,472.20 13,369.30	9,846.20 9,796.97	6,616.83	6,752.47
5,570.28 5,542.43	9,650.75	22,396.29 31,547.18 29,742.85	9,747.98 9,699.24 9,650.75	26,004.76	5,570.28 5,542.43
	9,602.49 9,554.48 9,506.71	41,649.24 53,695.24 66,028.37 84,414.92	9,602.49 9,554.48 9,506.71 9,459.18		
	9,459.18 9,411.88 9,364.82 9,318.00	97,035.62 110,743.44	9,411.88 9,364.82		
	9,271.41 9,225.05 9,178.92	139,361.16 154,289.36	9,271.41 9,225.05		

22,337.37

\$ 6,142,777

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF DELAWARE

IN THE MATTER OF THE APPLICATION OF)	
DELMARVA POWER AND LIGHT COMPANY)	
FOR APPROVAL OF SOLAR RENEWABLE)	
ENERGY CREDIT CONTRACTS AS SREC)	PSC DOCKET NO. 10-198
SUPPLY SOURCES FOR STANDARD OFFER)	
SERVICE CUSTOMERS (Filed June 1, 2010))	

CERTIFICATE OF SERVICE

Francis J. Murphy, Esq. hereby certifies that on August 11, 2010, he caused a copy of **THE TESTIMONY OF EXPERT WITNESS JOHN BYRNE, PH.D.** to be served on all persons on the service list attached hereto by electronic mail and otherwise as indicated on the service list.

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